



BUTTERFLIES AND MOTHS OF NORTH AMERICA

Successful butterfly and moth management and conservation efforts are limited by access to distribution data.

Importance of Pollinators

Pollinators play a crucial role in sustaining agricultural production and biodiversity around the world by enabling plants to reproduce. Bees, bats, birds, butterflies, moths, and many other species perform these economic and ecological functions every day.

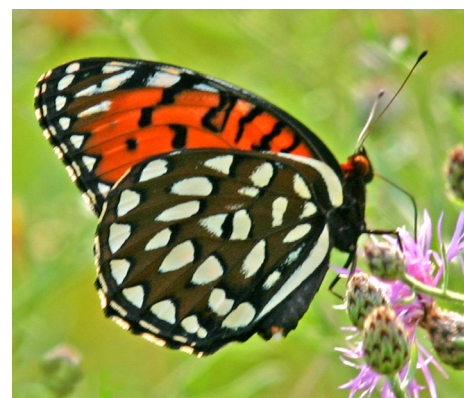
Unfortunately, many butterfly and moth species have been declining, partially due to the loss of habitat, including migratory and nectar corridors. Attempts to reverse this trend are underway, but successful butterfly and moth management and

conservation efforts are limited by access to distribution data and other important information. Information about habitat requirements of even the most common species are scattered in published literature or limited to generalized distribution maps available in paper field guides.

Providing Access to Butterfly and Moth Data

Butterflies and Moths of North America (BAMONA) <www.butterfliesandmoths.org> is a user-friendly database that contains the most comprehensive online distribution record of butterfly and moth species available for this region. More than 215,000 records and nearly 2,800 species accounts are accessible via the Web site through dynamic distribution maps, checklists, and species accounts that are generated in “real time,” offering users the most up-to-date information with each visit.

The data-rich Web site was unveiled by the National Biological Information



Regal fritillary (*Speyeria idalia*) feeding on knapweed flowers (*Centaurea* spp.)

Infrastructure (NBII) Mountain Prairie Information Node (MPIN) <<http://mpin.nbii.gov>> and the Big Sky Institute (BSI) at Montana State University <<http://bsi.montana.edu>> in June 2006. BAMONA has since drawn rave reviews from professional lepidopterists to backyard bug-catchers and has attracted up to 40,000 visits and half a million page views per month.

Features

- **Dynamic distribution maps** showing verified species occurrences;
- **Species checklists** for each county in the United States and each state in Mexico;
- **Species accounts** that describe size, identifying characteristics, life history, flight, caterpillar hosts, adult food, habitat, species range, conservation status, and management needs;
- **Photographs** of more than 1500 adults and caterpillars;
- **A glossary** that defines entomological terms utilized in species accounts; and
- **Links** to other regional butterfly and moth distributions.

Species Detail

Common Buckeye
Junonia coenia Hübn., [1822]

Attributes of *Junonia coenia*

Family: Brush-footed Butterflies (Glyceriidae)
Subfamily: True Brushfoots (Glyceriinae)

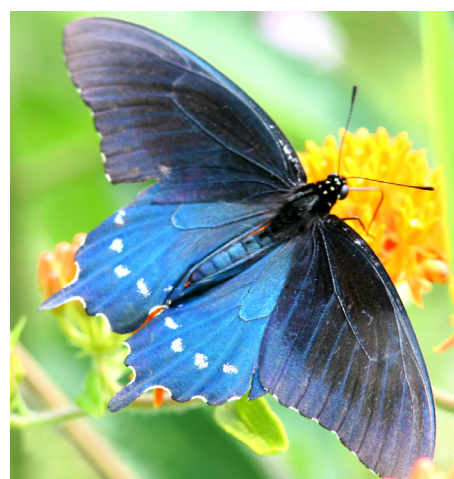
Identification: Upperside is brown. Forewing with 2 orange cell bars and 2 crescents; part of white submarginal band appears in the largest, lower crescent. Hindwing has 2 crescents; upper one is largest and contains a magenta crescent. Underside of hindwing is brown or tan in the wet season (summer) form and mottled in the dry season (fall) form.

Life history: Hatches beneath during the day on low plants or bare ground to which females, flying periodically to patrol or to chase other flying insects, females lay eggs.

Documented Records for *Junonia coenia*

Legend: ■ Record ■ Data Unavailable

Species detail pages include images, distribution maps, and other information.



Pipevine swallowtail (*Battus philenor*)

Data Collection

BAMONA data come from a variety of sources, including museum and personal collections, field observations, literature, and citizen scientists. The BAMONA database incorporates data and photographs collected by the U.S. Geological Survey Northern Prairie Wildlife Research Center (NPWRC) <www.npwrc.usgs.gov> from 1995-2005.

Today, partnerships between thirty volunteer regional coordinators and MPIN are central to the ongoing data collection effort, especially for data submitted by the public. A team of three lead coordinators, including renowned lepidopterist Dr. Paul A. Opler, work with the regional coordinators to provide valuable quality control for data collection by reviewing the required photograph submissions and by verifying species occurrence data and identification.

Standardized data collection methods lay the groundwork for future capabilities. Pertinent metadata such as date, specific location details and geographic coordinates, source, and species status are collected for each new record, where available.

Since the BAMONA site was launched, over 10,000 new county records have been added to the database. More than 200 high-quality photographs taken by amateur and



Larvae of the white-lined sphinx moth (*Hyles lineata*)



Imperial moth (*Eacles imperialis*)



Hummingbird clearwing moth (*Hemaris thysbe*) feeding on milkweed flowers (*Asclepias* spp.)

professional photographers have also been added to species pages and image galleries.

Partners

BAMONA is a collaboration between MPIN, the NBII Pollinators Project <<http://pollinators.nbii.gov>>, the BSI Ecological Informatics Lab, and the NPWRC.

The BAMONA database was built upon a foundation developed by the NPWRC, which hosted two distinct sites on butterflies and moths until forming a partnership with BSI and the NBII to update the technology and to make the data more accessible.

The NBII <www.nbii.gov> is a collaborative program to provide increased access to data and information on the nation's biological resources. MPIN is one of nine regional NBII nodes that coordinate and serve biological data and information specific to a region of the United States. The NBII Pollinators Project provides access to information to support monitoring, management, and conservation of pollinators, pollinator-dependent species, and pollinator habitats.

The BSI Ecological Informatics Lab is MPIN's primary partner, with a comprehensive goal of making ecological data more useful to society by bringing together natural sciences, geographic information systems, statistics, modeling, information technology, and computational programming.

Future

BAMONA was developed to ensure the ongoing availability of key distribution data. Long-term priorities include data download capabilities; incorporation of data from The Lepidopterists' Society, Art Shapiro, and other new partners; improved identification tools; and finer-scale mapping of individual points for researchers to integrate with mapping and modeling software. Partnerships with state coordinators, scientists, volunteers, photographers, and database managers are central to this endeavor, and MPIN and BSI are eager to explore additional ways to continue this important work. If you are interested in participating, please contact the BAMONA team.

For More Information

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Find us on the Web at
<www.butterfliesandmoths.org>.

